

Amendments To The Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (previously presented) A spherical rotary engine valve assembly for a combustion cylinder in an internal combustion engine, comprising:
 - a valve mounted for rotation and having a spherical shape with an opening formed within an outer surface of the valve, the opening having a shaped surface including a convex portion and a concave portion;
 - a seal having a first and second rings for sealing an interface between said valve and the combustion chamber, a force exerted on a portion of said first ring causing a force between said second ring and said valve outer surface; and
 - a contoured piston head formed on a piston operating within the combustion chamber, said contoured piston head having a first concave section generally conforming to a shape of said valve, and a second concave section having a deeper recess than said first concave section.
2. (previously presented) A spherical rotary engine valve assembly as recited in claim 1, further comprising a valve housing positioned adjacent said valve on a side of said valve generally opposite from the cylinder, a gap being defined between said valve and said valve housing, said valve housing including a trench for preventing a flow of gas in a direction within said gap.
3. (New) A rotary engine valve, comprising:
 - a spherical surface over a majority of said rotary engine valve, said spherical surface capable of substantially sealing the opening to the combustion chamber against fluid flow into or out of the combustion chamber as the spherical surface is positioned over the combustion chamber during rotation of the rotary engine valve; and
 - a shaped section having a surface with a different curvature than said spherical surface, the shaped section including a leading edge and a trailing edge, the leading edge capable of opening to the intake manifold and the combustion chamber before the trailing edge during rotation of the rotary engine valve, said shaped section capable of allowing fluid flow from the intake manifold into the combustion chamber when the leading edge of the

shaped section rotates past the intake manifold, portions of the shaped section adjacent the leading edge having a concave shape for enhancing initial volumetric fluid flow from the intake manifold into the combustion chamber as the leading edge rotates past the intake manifold.

4. (New) A rotary engine valve as recited in claim 7, the rotary engine valve further capable of allowing fluid flow from the combustion chamber to an exhaust manifold, the shaped section capable of allowing fluid flow from the combustion chamber to the exhaust manifold when the leading edge of shaped section rotates past the combustion chamber, the concave shape of the portions of the shaped section adjacent the leading edge capable of enhancing initial volumetric fluid flow from the combustion chamber into the exhaust manifold as the leading edge rotates past the combustion chamber.
5. (New) A rotary engine valve as recited in claim 7, the trailing edge of the shaped section compressing the fluid in the combustion chamber as the trailing edge rotates past the combustion chamber.
6. (New) A rotary engine valve as recited in claim 7, the shaped section getting narrower from the leading edge to the trailing edge for promoting turbulent flow of the fluid entering the combustion chamber.
7. (New) A rotary engine valve assembly, comprising:
 - a rotary engine valve rotating about a reference axis, the rotary engine valve capable of sealing an opening to a combustion chamber, and the rotary engine valve capable of allowing fluid flow from an intake manifold into the combustion chamber, the rotary engine valve including:
 - a spherical surface over a majority of said rotary engine valve, said spherical surface capable of substantially sealing the opening to the combustion chamber against fluid flow into or out of the combustion chamber as the spherical surface is positioned over the combustion chamber during rotation of the rotary engine valve, and

a shaped section having a surface with a different curvature than said spherical surface, the shaped section including a leading edge and a trailing edge, the leading edge capable of opening to the intake manifold and the combustion chamber before the trailing edge during rotation of the rotary engine valve, portions of the shaped section adjacent the leading edge having a concave shape for enhancing initial volumetric fluid flow from the intake manifold into the combustion chamber as the leading edge rotates past the intake manifold.

8. (New) A rotary engine valve assembly as recited in claim 7, the rotary engine valve further capable of allowing fluid flow from the combustion chamber to an exhaust manifold, the concave shape of the portions of the shaped section adjacent the leading edge capable of enhancing initial volumetric fluid flow from the combustion chamber into the exhaust manifold as the leading edge rotates past the combustion chamber.
9. (New) A rotary engine valve assembly as recited in claim 8, further comprising a valve housing generally surrounding the rotary engine valve, a gap being defined between the valve housing and the rotary engine valve, the valve housing including a trench for preventing a flow of fluid within the gap between the exhaust manifold and the combustion chamber.
10. (New) A rotary engine valve assembly as recited in claim 7, the trailing edge of the shaped section compressing the fluid in the combustion chamber as the trailing edge rotates past the combustion chamber.
11. (New) A rotary engine valve assembly as recited in claim 7, further comprising a piston head on a piston reciprocating within the combustion chamber, the piston head including a first concave area generally matching the curvature of the spherical section, and a second concave area having a greater concavity than the first concave area.
12. (New) A rotary engine valve assembly as recited in claim 7, further comprising a seal having a first and second rings for sealing an opening between said spherical portion of the rotary engine valve and the combustion chamber, a force exerted on a portion of said first ring causing a force between said second ring and the spherical portion of the rotary engine valve.

13. (New) A rotary engine valve assembly as recited in claim 7, further comprising an air runner within the intake manifold, the air runner capable of directing fluid to the portions of the shaped section adjacent the leading edge after the leading edge passes by the air runner.